

Site Investigation

Final

Site-Specific Field Sampling Plan Attachment
for Former Smoke Area S, Parcel 106(6)

Fort McClellan
Calhoun County, Alabama

Prepared for:

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List of Acronyms

ADEM	Alabama Department of Environmental Management
CLP	Contract Laboratory Program
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
CSEM	conceptual site exposure model
DOD	U.S. Department of Defense
DQO	data quality objective
EBS	environmental baseline survey
EPA	U.S. Environmental Protection Agency
ESE	Environmental Sciences and Engineering
FTMC	Fort McClellan
GPS	global positioning system
IDW	investigation-derived waste
IT	IT Corporation
NAD83	1983 North American Datum
NGVD	National Geodetic Vertical Datum
PID	photoionization detector
PSSC	potential site-specific chemical
QA/QC	quality assurance/quality control
QAP	installation-wide quality assurance plan
SAP	installation-wide sampling and analysis plan
SFSP	site-specific field sampling plan
SHP	installation-wide safety and health plan
SSHPP	site-specific safety and health plan
SI	site investigation
SVOC	semivolatile organic compound
TAL	target analyte list
TCL	target compound list
USACE	U.S. Army Corps of Engineers
VOC	volatile organic compound
WP	installation-wide work plan
UXO	unexploded ordnance

Executive Summary

This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT Corporation [IT], 1998a) for Former Smoke Area S at Fort McClellan, Calhoun County, Alabama, will be used in conjunction with the site-specific safety and health plan (SSHP), installation-wide work plan (WP) (IT, 1998b), waste management plan, the habitat-specific screening ecological risk assessment work plan, and the SAP. The SAP includes the installation-wide safety and health plan, and installation-wide quality assurance plan. Site-specific hazard analyses are included in the SSHP.

Former Smoke Area S is located due east of the central part of the Main Post. The site covers approximately 1 acre.

Former Smoke Area S is now an inactive training area that was equipped with smoke-generating equipment and fog oil from 1952 to 1970. A site investigation is being conducted to determine the presence or absence of potential contaminants.

Former Smoke Area S falls within the "Possible Explosive Ordnance Impact Area" shown on Plate 10 of the FTMC Archive Search Report, Maps (USACE, 1998a). Therefore, IT will conduct unexploded ordnance (UXO) avoidance activities, including surface sweeps and downhole surveys of soil borings.

Specifically, IT will collect two surface soil samples, two subsurface soil samples, four surface water samples, four sediment samples, and four depositional soil samples at the site. Potential contaminant sources include petroleum products (e.g., gasoline, diesel, heating oil, waste oil, and lubricants), solvents, and metals. Chemical analyses of the samples collected during the field program will include volatile organic compounds, semivolatile organic compounds, and metals. Additionally, sediment samples will be analyzed for total organic carbon and grain size. Results will be compared with site-specific screening levels specified in the WP and regulatory agency guidelines.

1.0 Project Description

1.1 Introduction

The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) of the Former Smoke Area S, under Delivery Order CK005, Contract No. DACA21-96-D-0018.

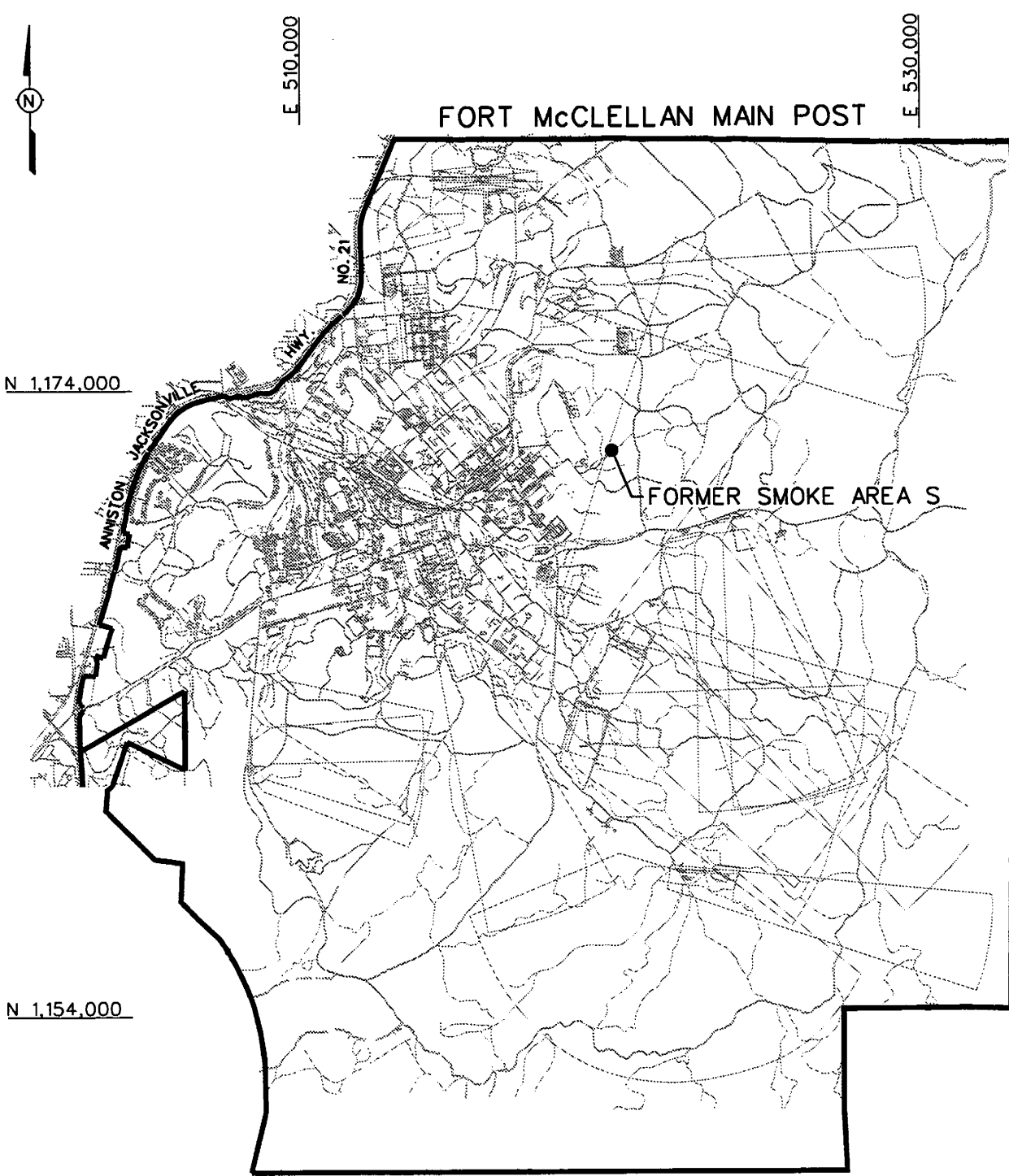
This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998a) for FTMC, Calhoun County, Alabama has been prepared to provide technical guidance for sample collection and analysis at Former Smoke Area S (Figure 1-1). The SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) developed for the Former Smoke Area S site, and the installation-wide work plan (WP) (IT, 1998b), waste management plan, the habitat-specific screening ecological risk assessment work plan, and SAP. The SAP includes the installation-wide safety and health plan (SHP), and installation-wide quality assurance plan.

1.2 Site Description

Former Smoke Area S is located due east of the central part of the Main Post (Figure 1-1). The study area covers slightly more than 1 acre. Its approximated dimensions are 150 feet wide (southeast to northwest) and more than 1,200 feet in length (northeast to southwest). The site and the area around the site is mostly undeveloped or wooded. There is an unnamed intermittent stream flowing from the northeast to the southwest along the southeast border of the site. Shallow groundwater at the site is probably controlled by surface drainage and/or topography. Site elevation is approximately 885 to 930 feet above sea level as established by the National Geodetic Vertical Datum (NGVD). Figure 1-2 is a site map showing topographic features and site boundaries.

The soil type at Former Smoke Area S is Montevallo. Montevallo are severely eroded, shaly silty clay soils. These soils are formed either by erosional forces, surface runoff, or natural reworking processes. Colors are typically yellowish-brown. The depth to bedrock is usually 1.5 feet or greater, while the depth to groundwater is typically 20 feet or greater. The high erosion hazard, low capacity for available moisture, and thin root zone make this soil unsuited for cultivation (U.S. Department of Agriculture, 1961).

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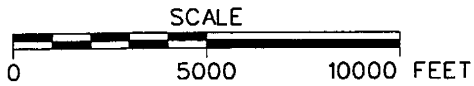


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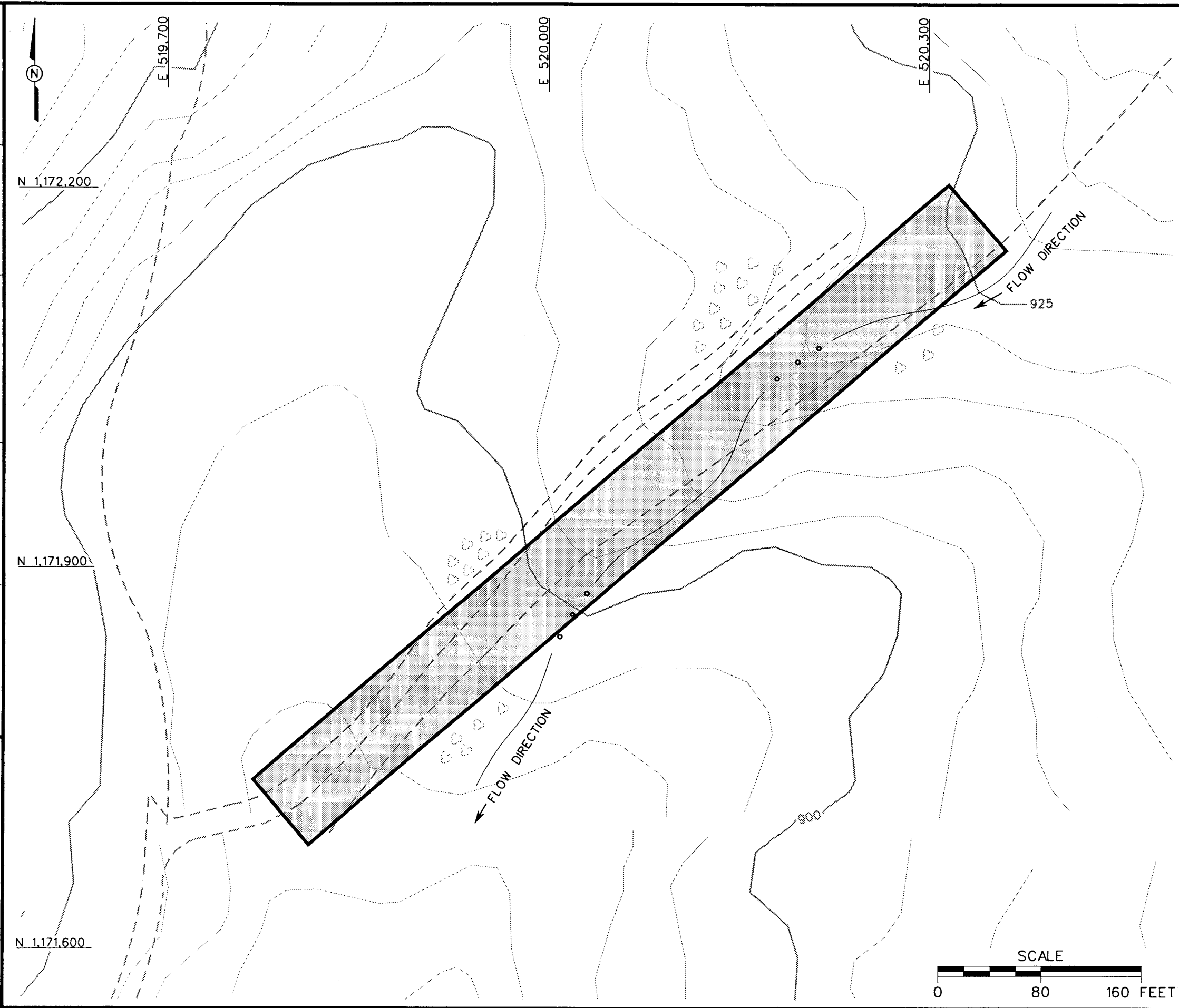
 FORT McCLELLAN BOUNDARY

FIGURE 1-1
SITE LOCATION MAP
FORMER SMOKE AREA S
PARCEL 106(6)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018



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- LEGEND**
- UNIMPROVED ROADS AND PARKING
 - TOPOGRAPHIC CONTOURS
 - PARCEL BOUNDARY
 - TREES / TREELINE
 - SURFACE DRAINAGE / CREEK

FIGURE 1-2
SITE MAP
FORMER SMOKE AREA S
PARCEL 106(6)

U. S. ARMY CORPS OF ENGINEERS
 MOBILE DISTRICT
 FORT McCLELLAN
 CALHOUN COUNTY, ALABAMA
 Contract No. DACA21-96-D-0018



1.3 Scope of Work

The scope of work for activities associated with the SI at Former Smoke Area S as specified in the statement of work (USACE, 1998b) includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.
- Conduct a surface and near surface unexploded ordnance (UXO) survey over all areas to be included in the sampling effort.
- Provide downhole UXO support for all intrusive direct-push activity to determine downhole hazards.
- Collect two surface soil, two subsurface soil, four surface water, four sediment, and four depositional soil samples to determine whether potential site-specific chemicals (PSSC) are present at Former Smoke Area S and to provide data to determine future planned corrective measures and closure activities.

Upon completion of the field activities and sample analyses, draft and final summary reports will be prepared in accordance with current U.S. Environmental Protection Agency (EPA) Region IV and the Alabama Department of Environmental Management (ADEM) requirements.

2.0 Summary of Existing Environmental Studies

Environmental Science and Engineering, Inc. (ESE) conducted an environmental baseline survey (EBS) to document current environmental conditions of all FTMC property (ESE, 1998). The study identified sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense (DOD) guidance on fast track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria.

1. Areas where no storage, release, or disposal (including migration) has occurred.
2. Areas where only storage has occurred.
3. Areas of contamination below action levels.
4. Areas where all necessary remedial actions have been taken.
5. Areas of known contamination with removal and/or remedial action underway.
6. Areas of known contamination where required response actions have not been taken.
7. Areas that are not evaluated or require further evaluation.

The EBS was conducted in accordance with the Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, ADEM, EPA Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

Former Smoke Area S consists of one site only. The site was identified as a CERFA site, where petroleum products were stored, released, disposed, and/or migration of hazardous substances is suspected, but are either not evaluated, or the sites require additional evaluation to determine the environmental condition of the site.

Former Smoke Area S is located east of the Central Main Post and was in use from 1952 to 1970. Currently, the site has unrestricted access. Training at the site used smoke-generating equipment and fog oil. Surface soil, subsurface soil, surface water, sediment, and depositional soils are media of potential concern.

The Smoke Areas are evident on historical aerial photographs (September 1, 1964). Smoke Area S was the primary training ground; nearby Smoke Area R was only used whenever Smoke Area S was occupied. Army personnel reportedly policed the Smoke Areas in 1973 when the U.S. Army Chemical School departed FTMC. Several old and new oil filters (for vehicles) were observed on the ground during the EBS site visit. Several smoke canisters were observed on the ground by IT during a site visit in April 1998. There are no buildings or structures at the site; however, pieces of cinder block and metal previously may have been used as fog oil drum racks are visible around the site.

There have not been any other investigations identified for the Former Smoke Area S site. The site is classified as a Category 6 CERFA site: areas of known contamination where response actions have not been taken.

The Former Smoke Area S site lacks adequate documentation and therefore requires evaluation to determine the environmental condition of the parcel.

3.0 Site-Specific Data Quality Objectives

3.1 Overview

The data quality objective (DQO) process is followed to evaluate data requirements and to support the decision-making process associated with the action for the Former Smoke Area S. The section incorporates the components of the DQO process described in the 1993 EPA publication EPA 540-R-93-071 *Data Quality Objectives for Superfund* (EPA, 1993). The DQO process as applied to the Former Smoke Area S is described in more detail in Sections 3.2 and 4.3 of the WP. Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples, and procedures to meet the objectives of the site investigation, and to establish a basis for future action at the site.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah (CESAS) Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using Contract Laboratory Program (CLP)-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

3.2 Data Users and Available Data

The intended data users and available data related to the SI at the Former Smoke Area S are presented in Table 3-1 and have been used to formulate a site-specific conceptual model. This conceptual model was developed to support the development of this SFSP, which is necessary to meet the objectives of these activities and to establish a basis for future action at the site. The data users for information generated during field activities are primarily EPA, USACE, ADEM, FTMC, and the USACE supporting contractors. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work.

3.3 Conceptual Site Exposure Model

The conceptual site exposure model (CSEM) provides the basis for identifying and evaluating the potential risks to human health in the risk assessment. Graphically presenting possible pathways by which a potential receptor may be exposed, including sources, release and transport pathways, and exposure routes, facilitates consistent and comprehensive evaluation of risk to human health,

Table 3-1

**Summary of Data Quality Objectives
Former Smoke Area S, Parcel 106(6)
Fort McClellan, Calhoun County, Alabama**

Potential Data Users	Available Data	Conceptual Site Model	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
EPA ADEM USACE DOD IT Corporation Other Contractors Possible future land users	None	Contaminant Source Fuels and fuel components Waste oils, metals	Surface Soils	SI to confirm or deny the presence of contaminants in the site media and locate source areas, if present.	<u>Surface soil</u> TCL-VOCs TCL-SVOCs TAL-metals	Definitive data in CESAS Level B data packages	2 direct-push samples + QC
		Migration Pathways Infiltration and leaching to groundwater. Dust emissions and volatilization from soil to air.	Surface Water		<u>Subsurface Soil</u> TCL-VOCs TCL-SVOCs TAL-metals	Definitive data in CESAS Level B data packages	2 direct-push samples + QC
		Infiltration to subsurface soil. Discharge of groundwater to surface water. Erosion and runoff. Volatilization from surface water to ambient air.	Sediment		<u>Surface Water</u> TCL-VOCs TCL-SVOCs TAL-metals	Definitive data in CESAS Level B data packages	4 samples + QC
		Potential Receptors Future resident, youthful Recreational site user Future ingestion of venison	Depositional Soils	Obtain sufficient data to support as appropriate the following: <ul style="list-style-type: none">Implementing an immediate response.No further action.Proceeding with a RI.	<u>Sediment</u> TCL-VOCs TCL-SVOCs TAL-metals TOC	Definitive data in CESAS Level B data packages	4 samples + QC
		PSSC Fuels Fuel components Waste oils Organics Metals			Grain size-ASTM D421/D422 <u>Depositional Soils</u> TCL - VOCs TCL - SVOCs TAL - Metals	Definitive data in CESAS Level B data packages	4 samples + QC

ADEM - Alabama Department of Environmental Management.
CESAS - Corps of Engineers South Atlantic Savannah.
DOD - U.S. Department of Defense.
EPA - U.S. Environmental Protection Agency.
PSSC - Potential site-specific chemical.
QC - Quality control.

SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
TOC - Total organic carbon.
USACE - U.S. Army Corps of Engineers.
VOC - Volatile organic compound.

and helps to ensure that potential pathways are not overlooked. The elements necessary to construct a complete exposure pathway and develop the CSEM include:

- Source (i.e., contaminated environmental) media
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptors
- Exposure pathways.

Contaminant release mechanisms and transport pathways are not relevant for direct receptor contact with a contaminated source medium.

Potential contamination at the Former Smoke Area S is due to the use of smoke generating equipment and fog oil. Petroleum products were stored, released, and disposed of at this site. Smoke Area S is located in the hills east of the Central Main Post and is surrounded by wooded areas. Currently there is unrestricted access to the location. An unnamed intermittent stream flows along the southeast border of the site. It is assumed that releases of any potential contaminants were restricted to surface soil and subsurface soil. Potential contaminant transport pathways include dust emissions and volatilization from soil to ambient air, infiltration to subsurface soil, infiltration and leaching to groundwater, discharge of groundwater to the surface, erosion and runoff to the surface water and sediment of the unnamed intermittent stream, and volatilization from surface water to ambient air.

Current site use is best described as unrestricted open space. The only plausible receptor under current site usage is the recreational site user. Other potential receptors considered but not included under current site use are:

- Resident: The site is neither currently used nor scheduled for residential development.
- Groundskeeper: The site is not actively maintained.
- Construction worker: The site is neither currently under development nor is development anticipated for the future.

As described in the Fort McClellan Comprehensive Reuse Plan, future plans call for this site to become part of Remediation Range 8 and 9 which will eventually be conveyed to the U.S. Fish and Wildlife Service for use as a National Wildlife Refuge (FTMC, 1997). The most plausible receptors for the future site use scenario remains the recreational site user. The future resident is also considered, along with venison ingestion.

The contaminant release and transport mechanisms, source and exposure media, receptors and exposure pathways are summarized in Figure 3-1 and Table 3-1.

Assessment of potential ecological risk associated with sites or parcels (e.g., surface water and sediment sampling, specific ecological assessment methods, etc.) will be addressed in a separate document to be issued as the habitat-specific screening ecological risk assessment work plan.

3.4 Decision-Making Process, Data Uses, and Needs

The decision-making process consists of a seven-step process that is presented in detail in Sections 3.2 and 4.3 of the WP and will be followed during the SI at Former Smoke Area S. Data uses and needs are summarized in Table 3-1.

3.4.1 Risk Evaluation

Confirmation of contamination at Former Smoke Area S will be based upon a comparison of detected site contaminants to the site-specific screening levels developed in the WP (IT, 1997b). EPA definitive data with CESAS Level B data packages will be used to achieve detection limits sufficient to determine whether or not the established guidance criteria are exceeded in site media. Definitive data will be adequate for confirming the presence of site contamination and for supporting additional decision-making steps, such as remedial action and risk assessment, if necessary.

3.4.2 Data Types and Quality

To meet the objectives of the SI at the Former Smoke Area S, it will be necessary to sample and analyze surface and subsurface soils, surface water, sediments and depositional soils. As described in Chapter 4.0 of this SFSP, quality assurance/quality control (QA/QC) samples will be collected for all sample types. Samples will be analyzed by EPA-approved SW-846 methods, where available; comply with EPA definitive data requirements; and be reported using hard copy data packages. In addition to meeting the quality needs of this SI, data analyzed at this level of quality are appropriate for all phases of site characterization, remedial investigation, and risk assessment.

3.4.3 Precision, Accuracy, and Completeness

Laboratory requirements of precision, accuracy, and completeness for this SI are provided in Chapter 9.0 of the QAP.

4.0 Field Activities

4.1 UXO Survey Requirements and Utility Clearances

The Former Smoke Area S, Parcel 106(6) site falls within the “Possible Explosive Ordnance Impact Area” shown on Plate 10 of the FTMC Archive Search Report, Maps (USACE, 1998a). Therefore, IT will conduct UXO avoidance activities, including surface sweeps and downhole surveys of soil borings in addition to conducting utility clearances before installing soil borings.

4.1.1 Surface UXO Survey

An UXO sweep will be conducted over areas that will be included in the sampling and surveying activities to identify UXO on or near the surface that may present a hazard to on-site workers during field activities. Low-sensitivity magnetometers will be used to locate surface and shallow-buried metal objects. UXO located on the surface will be identified and conspicuously marked for easy avoidance. UXO personnel requirements, procedures, and detailed descriptions of the geophysical equipment to be used are provided in Chapter 4.0 and Appendices D and E of the approved SAP (IT, 1998a).

4.1.2 Downhole UXO Survey

During the soil boring and downhole sampling activities, a downhole UXO survey will be performed to determine if buried metallic objects are present. UXO monitoring, as described in Chapter 4.0 of the SAP (IT, 1998a), will continue until undisturbed soils are encountered or the borehole has been advanced to 12 feet below ground surface, whichever is reached first.

4.1.3 Utility Clearances

After the UXO surface survey has cleared the area to be sampled and prior to performing any intrusive sampling, a utility clearance will be performed at all locations where soil and groundwater samples will be collected, using the procedure outlined in Section 4.2.6 of the SAP. The site manager will mark the proposed locations with stakes, coordinate with the FTMC installation to clear the proposed locations for utilities, and obtain digging permits. Once the locations are approved (for both UXO and utility avoidance) for intrusive sampling, the stakes will be labeled as cleared.

4.2 Environmental Sampling

The environmental sampling program during the SI at Former Smoke Area S includes the collection of two surface soil, two subsurface soil, four surface water, four sediment, and four depositional soil samples for chemical analysis. The samples will be collected and analyzed to provide data for characterizing the site in order to determine the environmental condition of the site and any further action to be conducted.

4.2.1 Surface Soil Sampling

Two surface soil samples will be collected at the locations described in the following subsections.

4.2.1.1 Sample Locations and Rationale

Surface soil samples will be collected near probable former smoke generator or fog oil storage points. The surface soil sampling rationale is presented in Table 4-1. A total of two surface soil samples will be collected at Former Smoke Area S. The proposed surface soil sampling locations are presented on Figure 4-1. Surface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2. The exact soil sampling locations will be determined in the field by the on-site geologist based on actual field conditions.

4.2.1.2 Sample Collection Procedures

Surface soil samples will be collected from the upper 1 foot of soil by direct-push technology in accordance with the procedures specified in Section 4.7.1.1 of the SAP. Collected soil samples will be screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP. Surface soil samples will be screened with the PID for information only; not to select samples to submit for analysis. Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Chapter 5.0, Table 5-1 of the QAP. Sample documentation and chain of custody (COC) will be recorded as specified in Section 4.13 of the SAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.2 Subsurface Soil Sampling

Two subsurface soil samples will be collected from the same locations as the surface soil samples described in Section 4.2.1.

4.2.2.1 Sample Locations and Rationale

Subsurface soil samples will be collected from the soil borings proposed on Figure 4-1. The subsurface soil sampling rationale is presented in Table 4-1. Subsurface soil sample

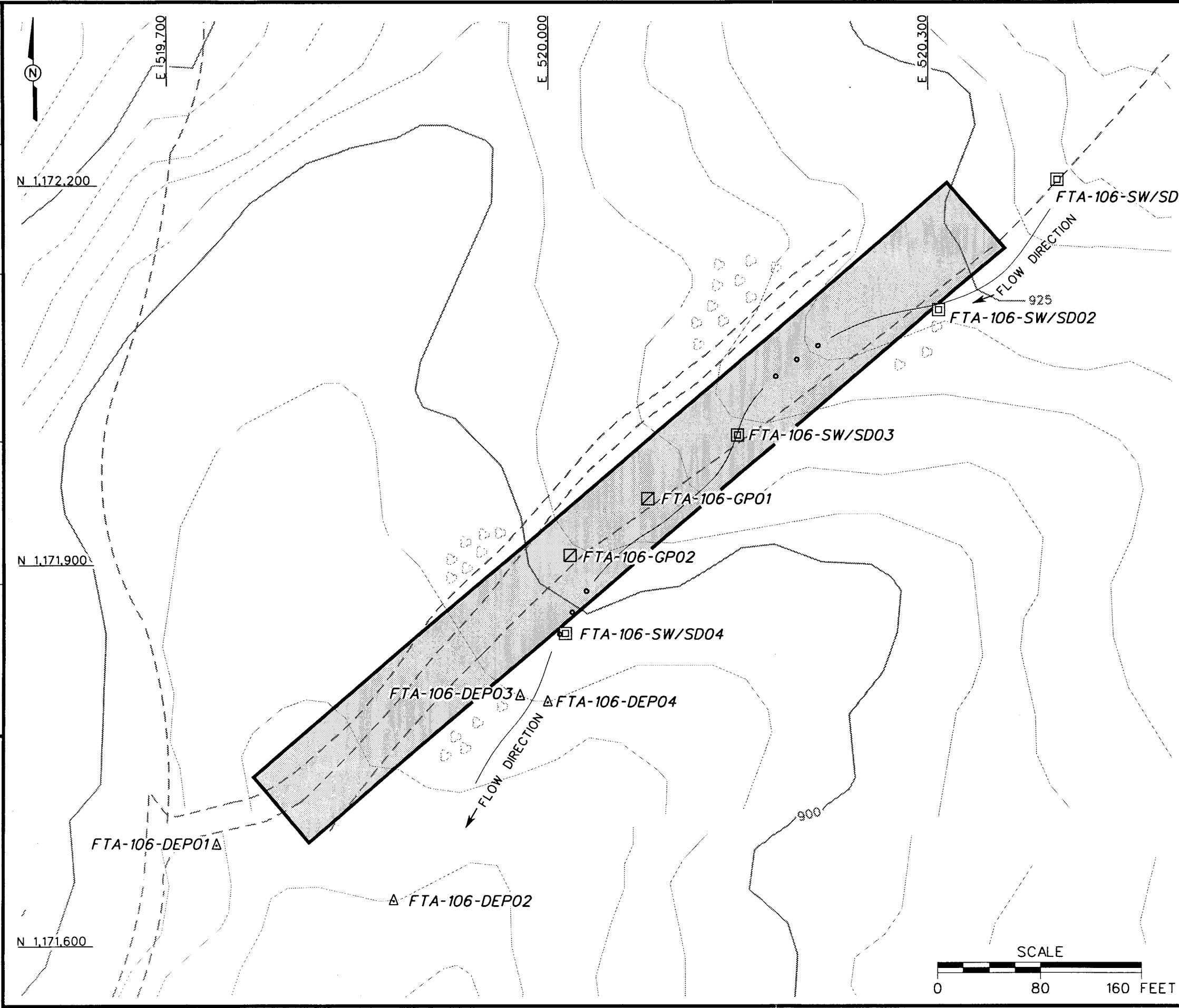
Table 4-1

**Site Sampling Rationale
Former Smoke Area S, Parcel 106(6)
Fort McClellan, Calhoun County, Alabama**

Sample Designation	Media Sampled	Location, Description, and Rationale
FTA-106-GP01	Surface Soil	Direct-push samples will be collected at the middle of the study parcel along the foot trail and near the stream, and near probable former smoke generator or fog oil storage points. Smoke canisters observed at this location.
FTA-106-GP02	Subsurface Soil	Direct-push samples will be collected alongside unpaved road/trail that runs along the northwest boundary of the study parcel, near probable former smoke generator or fog oil storage points. Smoke canisters observed at this location.
FTA-106-SW/SD01	Sediment Surface Water	Samples will be retrieved from the intermittent stream and the stream bed at a point upstream of where the stream enters the study parcel boundary. Sampling location represents the most hydrologically upgradient position on site. Sampling location also represents background sample.
FTA-106-SW/SD02	Sediment Surface Water	Samples will be retrieved from the intermittent stream and the stream bed at the point where the stream crosses both the parcel boundary and the foot trail running the length of the parcel.
FTA-106-SW/SD03	Sediment Surface Water	Samples will be retrieved from the intermittent stream and the stream bed at the middle of the study parcel along the foot trail near probable former smoke generator or fog oil storage points.
FTA-106-SW/SD04	Sediment Surface Water	Samples will be retrieved from the intermittent stream and the stream bed at the point where the stream exits the study parcel boundary. Sampling location represents the most hydrologically downgradient position on site.
FTA-106-DEP01	Depositional Soil	Sample will be retrieved from immediately downslope of the entrance point of the access road onto the study parcel. Sampling location represents the most likely spot for deposition of material eroded from the access road or road embankment. Sampling location is also at the lowest elevation in the vicinity of the site and, therefore, represents a potential infiltration point to deeper soil or groundwater.
FTA-106-DEP02	Depositional Soil	Sample will be retrieved from immediately downslope of the site. Sampling location is near the base of the slope where site is located and may be a potential infiltration point to deeper soil or groundwater.
FTA-106-DEP03	Depositional Soil	Sample will be retrieved from immediately downslope of the exit point of the intermittent stream from the study parcel. Sampling location represents the most likely spot for deposition of parcel soils carried offsite by stream. Any erosion of the site that occurred would have deposited some materials along the stream sides.
FTA-106-DEP04	Depositional Soil	Sample will be retrieved from immediately downslope of the exit point of the intermittent stream from the study parcel. Sampling location represents the most likely spot for deposition of parcel soils carried offsite by stream. Any erosion of the site that occurred would have deposited some materials along the stream sides.

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- LEGEND**
- UNIMPROVED ROADS AND PARKING
 - TOPOGRAPHIC CONTOURS
 - PARCEL BOUNDARY
 - TREES / TREELINE
 - SURFACE DRAINAGE / CREEK
 - PROPOSED SURFACE WATER/SEDIMENT SAMPLE
 - PROPOSED SURFACE AND SUBSURFACE SOIL SAMPLE
 - PROPOSED DEPOSITIONAL SOIL SAMPLE

FIGURE 4-1
PROPOSED SAMPLING LOCATIONS
FORMER SMOKE AREA S
PARCEL 106(6)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT INTERNATIONAL
TECHNOLOGY
CORPORATION

Table 4-2

Surface, Subsurface, and Depositional Soil Sample Designations and QA/QC Sample Quantities
Former Smoke Area S, Parcel 106(6)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-106-GP01	FTA-106-GP01-SS-FV0001-REG FTA-106-GP01-DS-FV0002-REG	0-1.0 ^a			FTA-106-GP01-DS-FV0002-MS FTA-106-GP01-DS-FV0002-MSD	TCL VOCs, TCL SVOCs, TAL Metals
FTA-106-GP02	FTA-106-GP02-SS-FV0003-REG FTA-106-GP02-DS-FV0006-REG	0-1.0 ^a	FTA-106-GP02-SS-FV0004-FD	FTA-106-GP02-SS-FV0005-FS		TCL VOCs, TCL SVOCs, TAL Metals
FTA-106-DEP01	FTA-106-DEP01-DEP-FV0007-REG	0-1.0				TCL VOCs, TCL SVOCs, TAL Metals
FTA-106-DEP02	FTA-106-DEP02-DEP-FV0008-REG	0-1.0				TCL VOCs, TCL SVOCs, TAL Metals
FTA-106-DEP03	FTA-106-DEP03-DEP-FV0009-REG	0-1.0				TCL VOCs, TCL SVOCs, TAL Metals
FTA-106-DEP04	FTA-106-DEP04-DEP-FV0010-REG	0-1.0				TCL VOCs, TCL SVOCs, TAL Metals

^a Actual sample depth selected for analysis will be at the discretion of the on-site geologist and will be based on field observation.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.

designations, depths, and required QA/QC sample quantities are listed in Table 4-2. A total of two subsurface soil samples will be collected from Former Smoke Area S.

4.2.2.2 Sample Collection Procedures

Subsurface soil samples will be collected from soil borings at a depth greater than 1-foot bgs in the unsaturated zone. The soil borings will be advanced and soils samples collected using the direct-push sampling procedures specified in Section 4.7.1.1 of the SAP.

Soil samples will be collected continuously for the first 12 feet or until either groundwater or refusal is reached. A detailed lithological log will be recorded by the on-site geologist for each borehole. At least one subsurface sample from each borehole will be selected for analyses. The collected subsurface soil samples will be field-screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP to measure samples exhibiting elevated readings above background (readings in ambient air). Typically, the subsurface soil sample showing the highest readings above background using the PID will be sampled and submitted to the laboratory for analysis. If none of the sample intervals collected indicate elevated readings on the PID, the deepest interval collected will be submitted for laboratory analyses. Subsurface soil samples will be selected for analyses from any depth interval if the on-site geologist suspects PSSC at the interval. Site conditions such as lithology may also determine the actual sample depth interval submitted for analyses. More than one subsurface soil sample will be collected if field measurements and observations indicate a possible layer of PSSC and/or additional sample data would provide insight to the existence of any PSSC.

Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP.

Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Chapter 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

4.2.3 Surface Water Sampling

Four surface water samples will be collected from the intermittent stream which flows along the southeastern border of the site.

4.2.3.1 Sample Locations and Rationale

The surface water sampling rationale is listed in Table 4-1. Surface water samples will be collected from the locations proposed on Figure 4-1. The surface water sample designations and required QA/QC sample requirements are listed in Table 4-3. The exact sampling locations will be determined in the field by the ecological sampler, based on drainage pathways and actual field observations.

4.2.3.2 Sample Collection Procedures

Surface water samples will be collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Chapter 5.0, Table 5-1, of the QAP. The samples will be analyzed for the parameters listed in Section 4.5.

4.2.4 Sediment Sampling

Four sediment samples will be collected from the same locations as the surface water samples described in Section 4.2.3.

4.2.4.1 Sample Locations and Rationale

The tentative locations for collection of the sediment samples are shown in Figure 4-1. Sediment sampling rationale is presented in Table 4-1. Sediment sample designations and required QA/QC sample requirements are listed in Table 4-3. The actual sediment sample points will be at the discretion of the ecological sampler, based on the drainage pathways and actual field observations.

4.2.4.2 Sample Collection Procedures

Sediment samples will be collected in accordance with the procedures specified in Section 4.9.1.2 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. The sediment samples will be analyzed for the parameters listed in Section 4.5.

4.2.5 Depositional Soil Sampling

Four depositional soil samples will be collected at Former Smoke Area S.

4.2.5.1 Sample Locations and Rationale

The depositional soil samples will be collected downslope of the entrance point of the site access road, downslope of the exit point of the intermittent stream and immediately downslope of the

Table 4-3

Surface Water and Sediment Sample Designations and QA/QC Sample Quantities
Former Smoke Area S, Parcel 106(6)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-106-SW/SD01	FTA-106-SW/SD01-SW-FV2001-REG	NA	FTA-106-SW/SD01-SW-FV2002-FD	FTA-106-SW/SD01-SW-FV2003-FS		TCL VOCs, TCL SVOCs, Total TAL Metals w/TOC, Grain Size (for sediment only)
	FTA-106-SW/SD01-SD-FV1001-REG	0 - 0.5				
FTA-106-SW/SD02	FTA-106-SW/SD02-SW-FV2004-REG	NA			FTA-106-SW/SD02-SW-FV2004-MS	TCL VOCs, TCL SVOCs, Total TAL Metals w/TOC, Grain Size (for sediment only)
	FTA-106-SW/SD02-SD-FV1002-REG	0 - 0.5			FTA-106-SW/SD02-SW-FV2004-MSD	
FTA-106-SW/SD03	FTA-106-SW/SD03-SW-FV2005-REG	NA				TCL VOCs, TCL SVOCs, Total TAL Metals w/TOC, Grain Size (for sediment only)
	FTA-106-SW/SD03-SD-FV1003-REG	0 - 0.5				
FTA-106-SW/SD04	FTA-106-SW/SD04-SW-FV2006-REG	NA				TCL VOCs, TCL SVOCs, Total TAL Metals w/TOC, Grain Size (for sediment only)
	FTA-106-SW/SD04-SD-FV1004-REG	0 - 0.5				

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

TOC - Total organic carbon.

VOC - Volatile organic compound.

site. The sampling rationale is listed in Table 4-1 and the proposed sampling location is shown on Figure 4-1. The depositional soil sample designation, depth, and required QA/QC sample quantities are listed in Table 4-2. The actual depositional soil sample point will be at the discretion of the ecological sampler, based on the physical characteristics of the drainage area and actual field observations.

4.2.5.2 Sample Collection Procedures

Depositional soil sample collection will be conducted in accordance with the procedures for surface soil sample collection specified in Section 4.9.1.1 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Chapter 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5.

4.3 Decontamination Requirements

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.1 of the SAP. Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.2 of the SAP.

4.4 Surveying of Sample Locations

Sampling locations will be marked with pin flags, stakes, and/or flagging and will be surveyed using either global positioning system (GPS) or conventional civil survey techniques, as necessary to obtain the required level of accuracy. Horizontal coordinates will be referenced to the Alabama State Plane Coordinate System, 1983 North American Datum (NAD83). Elevations will be referenced to the NGVD of 1929 or the North American Vertical Datum of 1988 (soon to be established on site).

Horizontal coordinates for soil, sediment, and surface water locations will be recorded using a GPS to provide accuracy within 1 meter.

Procedures to be used for GPS surveying are described in Section 4.3 of the SAP. Conventional land survey requirements are presented in Section 4.19 of the SAP.

4.5 Analytical Program

Samples collected at the locations specified in Chapter 4.0 of this SFSP will be analyzed for the specific suites of chemicals and elements based on the history of site usage, as well as EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected from the Former Smoke Area S site consist of the following analytical suite:

- Target compound list (TCL) volatile organic compounds - Method 5035/8260B
- TCL semivolatile organic compounds - Method 8270C
- Target analyte list (TAL) Metals - Method 6010B/7000.

In addition, the sediment samples will be analyzed for the following list of parameters:

- Total organic carbon - Method 9060
- Grain size - American Society for Testing and Materials D-421/D-422.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-4 of this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with CESAS Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported by the laboratory via hard copy data packages using CLP-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

4.6 Sample Preservation, Packaging, and Shipping

Sample preservation, packaging, and shipping will follow the procedures as specified in Section 4.13.2 of the SAP. Completed analysis request/chain-of-custody records will be secured and included with each shipment of coolers to:

Sample Receiving
Quanterra Environmental Services
5815 Middlebrook Pike
Knoxville, Tennessee 37921
Telephone: (423) 588-6401

Split samples collected for the USACE laboratory will be shipped to the following address:

Table 4-4

**Analytical Samples
Former Smoke Area S, Parcel 106(6)
Fort McClellan, Calhoun County, Alabama**

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples ^a					Quanterra Total No. Analysis	QA Lab Total No. Analysis
				No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	Splits w/ QA Lab (5%)	MS/MSD (5%)	Trip Blank (1/ship)	Eq. Rinse (1/wk/matrix)		
Former Smoke Area S - Parcel 106(6): 4 surface water, 12 soil matrix: 2 surface, 2 subsurface soil, 4 sediment, 4 depositional soils													
TCL VOCs	8260B	water	normal	4	1	4	1	1	1	1	1	9	1
TCL SVOCs	8270C	water	normal	4	1	4	1	1	1	1	1	8	1
Tot TAL Metals	6010B/7000	water	normal	4	1	4	1	1	1	1	1	8	1
TCL VOCs	8260B	soil	normal	12	1	12	1	1	1	1	1	16	1
TCL SVOCs	8270C	soil	normal	12	1	12	1	1	1	1	1	16	1
TAL Metals	6010B/7000	soil	normal	12	1	12	1	1	1	1	1	16	1
Former Smoke Area S Total:				48			6	6	6	1	6	73	6

* Field duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded up to the nearest whole number. Trip blank samples will be collected in association with water matrix samples for VOC analysis only. Assumed 4 field samples per day to estimate trip blanks. Equipment blanks will be collected once per event whenever sampling equipment is field decontaminated and re-used. They will be repeated weekly for sampling events that are anticipated to last more than one week. Assumed 20 field samples will be collected per week to estimate number of equipment blanks.

Ship samples to:	Quanterra Environmental Services 5815 Middlebrook Pike Knoxville, Tennessee 37921 Attn: John Reynolds Tel: 423-588-6401 Fax: 423-584-4315	USACE Laboratory split samples are shipped to:	USACE South Atlantic Division Laboratory Attn: Sample Receiving 611 South Cobb Drive Marietta, Georgia 30060 Tel: 770-919-5270
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QA/QC - Quality assurance/quality control.
MS/MSD - Matrix spike/matrix spike duplicate.
VOC - Volatile organic compound.
SVOC - Semivolatile organic compound.
TAL - Target analyte list.
TCL - Target compound list.
TOC - Total organic carbon.

USACE South Atlantic Division Laboratory
Attn: Sample Receiving
611 South Cobb Drive
Marietta, Georgia 30060
Telephone: (770) 919-5270.

4.7 Investigation-Derived Waste Management

Management and disposal of the investigation-derived wastes (IDW) will follow procedures and requirements as described in Appendix D of the SAP. The IDW expected to be generated at Former Smoke Area S will include decontamination fluids and disposable personal protective equipment. The IDW will be staged inside the fenced area surrounding Buildings 335 and 336 while awaiting final disposal.

4.8 Site-Specific Safety and Health

Safety and health requirements for this SI are provided in the SSHP attachment for Former Smoke Area S, Parcel 106(6). The SSHP attachment will be used in conjunction with the SHP.

5.0 Project Schedule

The project schedule for the site investigation activities will be provided by the IT project manager to the BRAC Closure Team on a monthly basis.

6.0 References

Environmental Science and Engineering Inc. (ESE), 1998, *Final Environmental Baseline Survey, Fort McClellan, Alabama*, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

Fort McClellan (FTMC), 1997, *Fort McClellan Comprehensive Reuse Plan*, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

IT Corporation (IT), 1998a, *Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama*, August.

IT Corporation (IT), 1998b, *Final Installation-Wide Work Plan, Fort McClellan, Calhoun County, Alabama*, August.

U.S. Army Corps of Engineers (USACE), 1998a, *Archives Search Report, Maps, Fort McClellan, Anniston, Alabama*, June.

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U.S. Department of Agriculture (USDA), 1961, *Soil Survey, Calhoun County, Alabama*, Soil Conservation Service, Series 1958, No. 9, September.

U.S. Environmental Protection Agency (EPA), 1993, *Data Quality Objectives Process for Superfund, Interim Final Guidance*, EPA 540-R-93-071, September.